Small Business Innovation Research/Small Business Tech Transfer

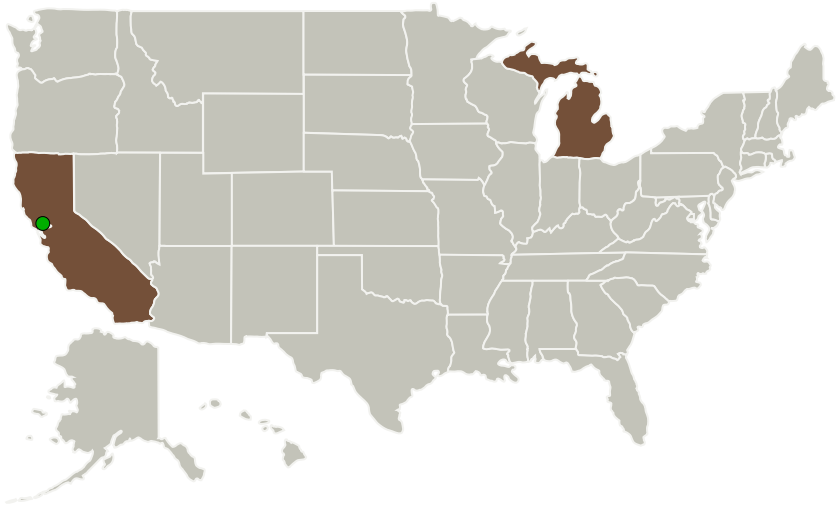
Holonic Spacecraft Autonomous Agents, Phase I

Completed Technology Project (2017 - 2017)

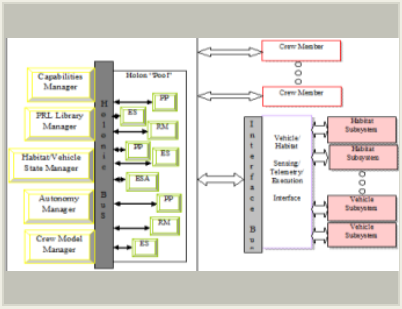
Project Introduction

In this proposal, Cybernet proposes to leverage our distributed Procedure Execution and Projection (PEP) system that focuses on supporting automation of complex spacecraft, subsystem, maintenance, and consumables management procedures while ensuring crew situational awareness and anticipating future problems. The PEP system will provide the capability to: • Work in a dynamic collaborative manner with crew to execute procedures, • Dynamically offload and re-assume tasking from automation, • Autonomously offload tasking from crew based on the system's initiative when perceiving that the crew member is overloaded or otherwise requires assistance, • Project forward in the task execution to look for potential problems and develop contingencies, • Ensure crew situational awareness even during complete automation handoff, • Work on multiple procedures at the same time while detecting procedure conflicts (such as for limited resources)

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California



Holonic Spacecraft Autonomous Agents, Phase I Briefing Chart Image

Table of Contents

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Holonic Spacecraft Autonomous Agents, Phase I

Completed Technology Project (2017 - 2017)

Primary U.S. Work Locations	
California	Michigan

Project Transitions

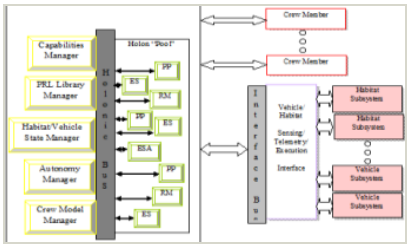
June 2017: Project Start

December 2017: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140754)*

Images



Briefing Chart Image
Holonic Spacecraft Autonomous Agents, Phase I Briefing Chart Image
(https://techport.nasa.gov/image/134666)

Project Management

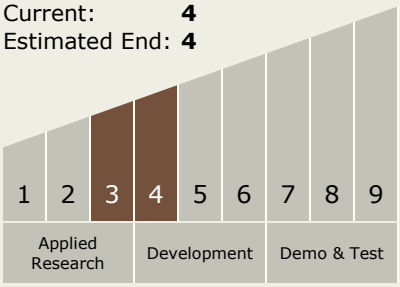
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Charles Jacobus

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



Technology Areas

Primary:

- TX10 Autonomous Systems
  - TX10.2 Reasoning and Acting
    - TX10.2.2 Activity and Resource Planning and Scheduling

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System